



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

Applicant's or agent's file reference HM/PH/8562INT		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB 03/03796	International filing date (day/month/year) 03.09.2003	Priority date (day/month/year) 03.09.2002	
International Patent Classification (IPC) or both national classification and IPC G01P3/68			
Applicant LOUGHBOROUGH UNIVERSITY ENTERPRISES LIMITED et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 01.03.2004		Date of completion of this report 16.09.2004	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Felicetti, C Telephone No. +49 89 2399-2183 	

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EXAMINATION REPORT**

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I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-25 as published

Claims, Numbers

1-47 as published

Drawings, Sheets

1/8-8/8 as published

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 7-47

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 7-47

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Yes: Claims

No: Claims 1-6

Inventive step (IS)

Yes: Claims

No: Claims 1-6

Industrial applicability (IA)

Yes: Claims

No: Claims

2. Citations and explanations

see separate sheet

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The following documents were cited in the Search Report. The numbering will be used throughout the further procedure:

- D1: US 2001/023209 A1 (YAMAMOTO AKIO) 20 September 2001 (2001-09-20)
- D2: WO 02/35904 A (NIEDERNDORFER FRIEDRICH ;ABATEC ELECTRONIC AG (AT)) 10 May 2002 (2002-05-10)
- D3: US-A-5 471 383 (DAYS CHARLES ET AL) 28 November 1995 (1995-11-28)
- D4: US-A-6 042 483 (KATAYAMA SHU) 28 March 2000 (2000-03-28)
- D5: US 2002/022531 A1 (KATAYAMA SHU) 21 February 2002 (2002-02-21)
- D6: GB-A-2 166 920 (WILD HEERBRUGG AG) 14 May 1986 (1986-05-14)

1 Non-establishment of opinion:

No opinion will be established for claims 7-47, since for the reasons explained in the annex to the search report, no search has been performed for the subject matter of these claims.

2 Clarity, support in the description (Article 6 PCT):

Claim 1 makes reference to projectiles having a set of orientation identifiers distributed "such that for every orientation of the projectile there exists from any fixed perspective a unique viewable configuration of a sub-set of the identifiers". This wording defines an object to be achieved, rather than clear and ascertainable technical features.

The applicant has argued that a functional definition is the only appropriate way of defining the current invention, and that the description would clearly indicate how the existence of a "unique viewable configuration from any fixed perspective" could be verified.

However, the definition given in the claim is extremely broad compared to the specific embodiments disclosed, and the algorithms defined in the description are only disclosed in connection with these specific embodiments.

The wording of the claims does not specify any details about shape, number, position, or other properties of suitable "identifiers", nor mention in any way how the distribution can be made "unique" from all perspectives and for all orientations.

Thus, the present wording does not clearly define the essential features.

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It is noted that many devices e.g. coins, globes etc. have enough information on their surfaces to allow such an identification.

Taking in particular a projectile in form of a plastics globe, having imprinted on its surface the continents and countries of the earth, as it would appear that such an object constitutes a projectile which contains a set of identifiers which is unique for any orientation, and from any perspective.

Also coins have unique identifiers on their surface, which allow a precise determination of their position and orientation, from any perspective. German coins used to have text printed also on their side face, around the circumference, so that even looking at the coin from the side the orientation could be determined.

For the purpose of further examination, a projectile which has markings on its surface which allow identification of its position and orientation in space will be interpreted to fall under the definition.

↗ A similar clarity problem is also present in claim 4, which does not specify the way in which the orientation of the projectile could be determined, either. Also this claim does not contain specific information about the way in which the object is marked, and about the way in which the orientation is derived from the markings.

Thus, the claims mentioned above do not meet the requirements of Article 6 PCT.

3 Novelty (Article 33(2) PCT):

In view of the unclear wording of the claims, the subject matter of claims 1-6 lacks novelty over the disclosure of D1.

D1 discloses a system for measuring the flight/motion of a projectile, e.g. a golf ball, comprising a set of orientation identifiers (Fig. 4A) which allow determination of the position and orientation of the projectile.

According to para.15, the launch of the projectile is detected e.g. by a sound sensor and the like.

According to para.16-17, strobes of flashlight are produced to produce images containing a sub-set of the orientation identifiers using a CCD camera, which allows to determine (translation) speed and rotational amount of the ball.

According to para.25,26 and 63, the situation of the surface of the ball including the brand information can be confirmed on the images, and the rotational amount can be computed easily.

The applicant has argued that the specific example of a marking in form of a brand information 'ABCDE' in D1 constitutes "a single orientation identifier", and that there will be positions where this orientation identifier will be invisible for the camera.

However, it is noted that according to D1, Figures 4A and 4B and para. 25,26 and 63, a pattern has to be present on the ball, which can be confirmed on an image. Figure 4B clearly shows that parts of the pattern may be invisible, and para. 63 mentions that as an example the movement distance of two single characters may be monitored.

Thus, according to D1 at least the individual characters, or even parts of them which can be identified, will be used as markers / orientation identifiers.

Noting further that D1 does not mention that a specific positioning of the ball before hitting would be required, or that only a limited amount of rotation would be measurable, it can be concluded that the applicant implicitly assumes that sufficient marking information will be visible for the camera at any point in time to perform an analysis of the amount of rotation.

Thus, the subject matter of claims 1-6 does not meet the requirements of Article 33(2) PCT.

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4 Inventive step (Article 33(3) PCT):

It is noted that also other documents cited in the search report relate to the determination of spin and velocity of a projectile, and make reference to orientation markers which allow a unique determination of position and orientation of the projectile.

Attention is particularly drawn to D2, claims 1,24 and 25 which mentions explicitly that a sufficient number of individually distinguishable markers has to be provided such that at any position and in any orientation at least six markers are visible for the detector. In this way both translation and rotation of an object can be determined.

Thus, starting from systems of the type known e.g. from D3 which have known limitations (compare D3, column 8: some dots may not be captured), the skilled person aware of the teachings of D2 would consider increasing the number of uniquely identifiable markers and placing them on the whole surface such that the position and orientation may be determined at any time, and the required minimum number of markers is visible at any time.

Therefore, having regard to D1-D3, the subject matter of claims 1-6 does not involve an inventive step.

5 Further remarks:

- 5.1** Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document cited in the search report is not mentioned in the description, nor are these documents identified therein.